Exemption No. 6634

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of **Franklin Products, Inc.,** for exemption from 14 CFR § 25.853(a)	**Regulatory Docket No. 28768**

PARTIAL GRANT OF EXEMPTION

By an undated letter from Mr. Kevin E. Foley, a letter dated January 22, 1997, and faxes dated February 4 and February 5, 1997, from Mr. Ron Picard, Franklin Products, Inc., 153 Water Street, P.O. Box 117, Torrington, CT 06790-0117, petitioned for exemption from vertical burn test requirements for water-based adhesives used in the manufacture of their seat cushions. Water-based adhesives are the only viable alternatives to solvent-based adhesives which do comply with these requirements, but which are becoming no longer available.

Affected Sections of the FAR:

Section 25.853(a) requires that materials in occupied compartments must meet the applicable (12-second vertical burn test for seat cushions) test criteria prescribed in Part I of Appendix F.

Related Sections of the FAR:

Section 25.853(c) requires that seat cushions, in addition to meeting the (vertical burn) test requirements of § 25.853(a), must also meet the (oil burner) test requirements of Part II of Appendix F.

ANM-97-015-E

The petitioner's supportive information is as follows:

Franklin Products respectfully requests exemption from the vertical burn requirements of § 25.853(a), as discussed in the guidance on page 945 of Advisory Circular (AC) 25-17, for the adhesives used in producing seat cushions for the airlines market. Having been recently apprised of the existence of this AC, a review of this AC indicates that we are in noncompliance with § 25.853(a). Prior to being made aware of this AC, our interpretation of § 25.853 has been that the major components of the cushion assembly (foams, cover materials, and flotation materials) must meet § 25.853(a), while the cushion assembly, where the adhesive is introduced, is governed by the oil burner test requirements of § 25.853(c).

With the pending elimination of solvent-based adhesives, we went forward with the testing and incorporation of water-based adhesives. All of our § 25.853(c) qualification oil burner testing since July of 1994 has been conducted using water-based adhesives.

Although our current water-based adhesive does not comply with the vertical burn test requirements of § 25.853(a), as explained in AC 25-17 guidance criteria, it does allow compliance with the oil burner test requirements of § 25.853(c), and does not create an unsafe condition. Franklin products is always seeking to meet the requirements of the FAA and its customers, while always looking out for the safety of the flying public. This exemption is in the best interests of Franklin Products, its employees, its community, and its customers.

Section 25.853(a) states that, "Materials (including finishes or decorative surfaces applied to the materials) must meet the applicable test criteria prescribed in Part I of Appendix F of this part or other approved equivalent methods." In recent discussions, the FAA has advised us that adhesives must be considered a material, in accordance with the guidance in AC 25-17, and tested accordingly. Currently, Franklin Products uses a water-based adhesive that has not been able to pass § 25.853(a) requirements in all applications. The change to a water-based adhesive was driven by an Environmental Protection Agency (EPA) ruling which bans the use of 1.1.1 Trichloroethane used in solvent-based adhesives. We are familiar with two such adhesives: Blue Coral and Stabond NS230. Within a year, the stockpile of these products will be exhausted. However, any manufacturing company currently using chemicals which are alleged to be ozone-depleting must register with the EPA so that the ventilation systems can be monitored. A tax would have to be paid in accordance with the volume of chemicals being exhausted into the air. Also, it is our understanding that any product produced using chemicals which are ozone-depleting must be labeled stating this fact.

Faced with these issues, Franklin Products selected a water-based adhesive after an extensive research program which is still ongoing. The following is a list of products we evaluated, along with a short summary of findings and conclusions:

- Solvent-Based Adhesives (Methelene Chloride)

These products were eliminated with little testing, due to the fact that they are suspected of being a carcinogen. The safety of our employees was of prime importance to Franklin Products.

- Hot-Melt Adhesives.

These adhesives, although they pass the requirements of § 25.853(a), are not suited for the production of cushions, nor are they capable of maintaining a bond in the extreme environments which cushions are exposed to. The products evaluated were produced by 3M, Pam, and National Starch.

- Water-Based Adhesives

In our evaluation of these types of adhesives, we concluded that a water-based adhesive was safer (for the employees) to use, its method of application was very similar to how we were already producing cushions, and it performed similarly to solvent-based adhesives. Franklin Products evaluated six manufacturers: 3M, National Starch, Mid-South Adhesives, Alpha Adhesives, Imperial Adhesives, and Franklin Adhesives. Three of the adhesives considered were worthy of further testing, including flammability testing. The other three (Franklin, Imperial, and Mid South) did not produce a quality bond, and were consequently dropped from consideration. All of the samples received from the three suppliers can not pass the requirements of § 25.853(a) as described in AC 25-17. Because we felt that this type of adhesive was user-friendly, we conducted oil-burner tests in accordance with § 25.853(c) on three of the above manufacturer's adhesives: National Starch, Alpha Adhesive, and 3M. Various design configurations were evaluated, and all samples passed the oil burner test. The weight losses and burn lengths of these test samples were similar to those produced by identical samples assembled using a solvent-based adhesive that had passed the vertical burn test of § 25.853(a).

Franklin Products concludes that the results of the oil burner test are more indicative of a real-world scenario. We believe that the vertical burn test helps us to substantiate that the material used in producing cushions will have the same burn qualities as the foams used when performing the oil burner test. Each new lot of foam or fabric used in producing a cushion is subjected to the vertical burn test. Substantiation of the cushion configuration, which includes gluing, is accomplished during the oil burner test.

Franklin Products' selection of water-based adhesives can be summarized as follows:

1. Solvent-based adhesive using 1. 1. 1 Trichloroethane will no longer be produced.

2. Any company using ozone-depleting chemicals must register with the EPA, causing cost penalties.

3. Solvent-based adhesives using Methelene Chloride are suspected of being carcinogenic. Employee safety is a factor.

4. There is no measurable difference between water-based and solvent-based adhesives when conducting oil burner tests. The safety of the traveler is still maintained.

5. Manufacturing systems are similar, eliminating potential construction problems and field failures of bonded surfaces.

6. It is our understanding that the FAA's Technical Center in Atlantic City, New Jersey, shares a view similar to ours, that the oil burner test is more indicative of the cushion's overall flammability resistance as it is used in service.

7. The vertical burn test confirms that the materials used in the product share similar burn characteristics to those used when conducting the oil burner testing.

We have been using water-based adhesives as our primary adhesive for 2 1/2 years. Changing to another adhesive would require the purchase of new equipment and an overhaul of the ventilation and work stations throughout our facility. We would also need to order and receive new adhesives. Since the production of 1.1.1 Trichloroethane has already been banned, a new adhesive during this period of time would likely contain Methelene Chloride which would cause serious concern for our employees. A delay would also cause a hardship for our customers, who would not be able to complete their seat assemblies or cushion replacement programs while we are delayed.

Why granting the requested exemption would be in the public interest:

- Water-based adhesives are both user-friendly and environmentally safe. Replacing solvent-based adhesives is in the best interest of the public. 1.1.1 Trichloroethane-based adhesives are harmful to the environment. Methelene Chloride-based adhesives are a suspected carcinogen.

- To continue using solvent-based adhesives would impose substantial cost increases, making us less competitive with European suppliers and may ultimately mean loss of jobs in the United States.

- Based on our investigation of alternative adhesives, it was determined that using water-based adhesives was our only option. If we were not to receive an exemption, we would have to close our doors. Our employees' lives would be disrupted as well as those of our customers.

- The performance of water-based adhesives that we subjected to testing in accordance with § 25.853(c) was equal to or better than that of solvent-based adhesives. The safety of the traveling public is maintained.

Justification for seeking a permanent exemption, rather than a time-limited exemption:

- We seek a permanent exemption for water-based adhesives, due to the fact that as of this date all of these types of adhesives do not comply with the regulations. Franklin Products will continually evaluate alternative types of adhesives in an effort to comply totally with the regulation. If required by the FAA, Franklin Products will submit yearly reports as to our progress in achieving this goal.

- Molding is perhaps a method of fabrication which can produce cushions using the least amount of adhesives. However, the cost of equipment and tooling is substantial, and we would still have to use some adhesives in providing a finished product. Gluing down of Velcro panels is required for the attachment of covers and cushion placement.

Among various alternative adhesives available in the market place, Franklin Products has selected a product produced by ALFA Adhesives, trade-named "Simalfa 308," as the specific adhesive proposed by Franklin Products to be permitted by the exemption sought. The rationale for choosing this specific adhesive is indicated below:

- Burn qualities are similar to other water-based adhesives evaluated.

- Less acidic than others evaluated.

- One-part system reduces the complexity of dispensing systems. Also assures proper mix of adhesive and activator.

- Maintains bond at elevated temperatures 150 to 180 degree Fahrenheit.

Franklin Products has determined that the water-based adhesive used in any combination of foams and fabrics is subject to failure of the vertical burn test. We don't understand the need for an FAA Designated Engineering Representative (DER) to witness a test failure. However, Franklin Products has demonstrated that cushions constructed with the water-based adhesive successfully pass the oil burner test with a high margin of safety. Test reports of oil burner tests witnessed by a DER support our claim that the adhesive is safe for use in passenger cabins.

A summary of Franklin Products' petition was published in the Federal Register on March 11, 1997 (62 FR 11249). No comments were received.

The FAA's analysis/summary is as follows:

The FAA notes with considerable concern that the petitioner, who is a manufacturer of aircraft seat cushions, had until recently been unaware for years of at least a portion of highly relevant FAA guidance documentation (i.e., AC 25-17 and AC 25.853-1) that are essential for understanding and fully complying with the intent of the pertinent flammability regulations. Except that the cushions produced during that interval are encased in a required fire blocking layer, thus shielding the occupants of a passenger cabin from adverse effects of any non-compliant adhesives, this lack of awareness could have had serious consequences.

Although beyond the scope of this exemption, it is apparent that the petitioner had not been accomplishing required flammability tests on seat cushion adhesives even when certain of those adhesives which were available (i.e., solvent-based) could comply with those requirements. Nevertheless, now that solvent-based adhesives are not viable products, and water-based adhesives which do not to date comply with FAA flammability requirements are the only viable products available, the petitioner properly seeks exemption to address the use of those adhesives.

The FAA considers that some measure of relief is warranted, due to circumstances beyond the control of the petitioner. But, as a matter of public safety, the FAA is particularly concerned with any digression from full compliance with flammability requirements, and is particularly not inclined to grant the exemption on the permanent basis sought. Consequently this response is intended to provide the requisite amount of relief, while limiting that relief only to the degree the FAA considers absolutely necessary.

Except as indicated below to avoid creating an unnecessary hardship on owners of affected seat cushion assemblies in service (i.e., the operators), which are already inherently life-limited, the granted relief to Franklin Products shall expire after a period of time considered reasonable by the FAA for developing or discovering a replacement, compliant adhesive. During this period of time, in addition to searching for a compliant adhesive, the petitioner shall also be required to explore alternative methods for constructing seat cushion assemblies. This provision is added so that alternatives to adhesives are addressed in the event that no compliant adhesives are developed by the expiration date of this grant.

The continued compliance of affected, fully-assembled seat cushions with the very severe, and much more meaningful, oil burner test requirements of § 25.853(c), even when these cushions are assembled internally with adhesives that do not pass the much less rigorous vertical burn flammability test requirements of § 25.853(a), provides a justification for this limited grant of exemption. Recent fleet-wide surveys have indicated that the integrity of seat cushion fire-blocking in service is generally maintained sufficiently to assure the degree of fire protection

required. Therefore, the primary consideration here is to assure that none of the non-complaint adhesive is exposed to the airplane cabin. This has been made a condition of this exemption.

Notwithstanding the above, in consideration of the possibility that the integrity of an affected seat cushion may be breached in service to expose some non-compliant adhesive to the cabin environment, and that same cushion is then subjected to a fire, a concern exists to minimize the flammability of the adhesive used. This may be accomplished for the range of non-compliant adhesives available by utilizing (an) adhesive(s) with the most favorable flammability characteristics. Consequently, as a condition of this grant, for any specific adhesive proposed by the petitioner for use in the construction of seat cushions, the FAA is requiring the petitioner to submit to this office, the associated FAA- or DER-witnessed test results conducted in accordance with the 12-second vertical burn requirements of § 25.853(a). The FAA shall review those test results, and if warranted by the lack of unacceptable burn characteristics, provide the petitioner with a formal written authorization to use that specific adhesive only. It is emphasized that this grant does not permit the use of all examples of water-based adhesives. To the contrary, under the terms of this grant, each particular adhesive that is desired for use by the petitioner must receive an individual approval from the FAA.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest, and is determined to have no more than a negligible effect on the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 USC 40113 and 44701, delegated to me by the Administrator (14 CFR 11.53), Franklin Products' petition for exemption from the vertical burn test requirements of § 25.853(a) for Franklin Products' seat cushion assemblies constructed with non-compliant water-based adhesives is granted until May 30, 1999, under the conditions listed below. In addition, the FAA intends that the effect of this exemption be that other persons installing Franklin Products seat cushions manufactured in accordance with this exemption, or operating airplanes on which such cushions are installed, are allowed to engage in those activities, notwithstanding other regulations [e.g., 14 CFR §121.312(b)] which would otherwise require use of seat cushions complying with § 25.853(a). Finally, it is the FAA's intent that Franklin Products' seat cushions manufactured under the auspices of this exemption and prior to its expiration, may be installed into service subsequent to its expiration and/or continue to be utilized in service for the service life of those cushions.

(1) Franklin Products shall continue to work with adhesives suppliers to develop an adhesive which complies with all requirements. Concurrently, Franklin Products shall pursue other means of construction which avoid adhesives.

(2) This exemption is valid only for Franklin Products' seat cushion assemblies that are constructed such that any non-compliant adhesives are completely encased in fire blocking, without any exposure of these adhesives to the aircraft cabin.

(3) Franklin Products' utilization of non-compliant water-based adhesives in the construction of seat cushions shall be restricted to those adhesives which provide, in the FAAs determination, acceptable burn results. Franklin Products shall submit a proposal in this regard, together with an FAA- or DER-witnessed test results report, to the FAA Transport Airplane Directorate, Attn: Docket 28768, and obtain its concurrence prior to the utilization of the proposed adhesive.

(4) Seat cushion assemblies manufactured under the auspices of this grant of exemption shall include the indelible and conspicuous identification that they do not comply with § 25.853(a) vertical burn test requirements, in accordance with this referenced exemption.

Issued in Renton, Washington, on June 4, 1997

/s/
Darrell M. Pederson
Acting Manager
Transport Airplane Directorate,
Aircraft Certification Service